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ABSTRACT

With many English teachers now opting to teach writing and literature courses in electronic environments, some of the teachers' most significant experiences in these environments have stemmed from their attempts to make technology available as a literacy tool for culturally diverse student populations. Computer-mediated communication can broaden the definition of writing to include concepts of multimedia and multi-literacy and address the necessary integration of text and visuals and foregrounding the elements of electronic environments requiring revision of teacher and student responses to students' texts. A writing assignment in an upper-level course in professional communication shows the need to work with student writers to develop revised evaluation practices and criteria that acknowledge collaborative writing, revising, and responding within an electronic medium as well as the ability to integrate visuals, texts, and sound to address the shifting definitions of literacy fostered by electronic writing classrooms. Although students and their teachers need to learn to view non-linear, multimedia, hypertextual communications as "writing," the extent to which these attitudes can change will necessitate not only a redefinition of textuality but also a redefinition of teaching and assessment. Teachers new to electronic environments should have the opportunity to be students in these settings, an important chance not only to understand the new technologies of literacy and the communication processes their own students will face in the classroom. (Contains 18 references.) (RS)

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TECHNOLOGY, TEACHER TRAINING, AND POSTMODERN LITERACIES

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With many English teachers now opting to teach writing and literature courses in electronic environments, some of our more significant experiences in these environments have stemmed from our attempts to make technology available as a literacy tool for our culturally diverse student populations. While such students' access has often been limited by issues of race, class, gender, and generation, these same students frequently see their resulting lack of knowledge as an essential inability to learn or write with computers. In attempting to subvert this attitude, my own goal is to construct educational experiences that allow students to view technology as a means to foster collaborative knowledge-making and change the traditional power/knowledge relationships in the writing classrooms that privilege the sole authority of the teacher in critiquing and responding to student work.

Yet even as computer technologies become more central to writing theory and instruction, among the cited benefits to users are a democratizing potential to focus on collaboration and community and, consequently, an equally democratizing potential to distribute power, authority, and knowledge. Cynthia Selfe (1990) observes that computers are "powerful tools for generating, exchanging, and accessing written information," and can "change the nature of written communication, and, thus, the nature of literacy education itself" (p. 118). However, we must also acknowledge that computers can become tools of empowerment only if teachers are trained to employ more dialogic pedagogy and assessment practices within electronic settings, for as Selfe and Selfe (1994) more recently contend, "The rhetoric of technology obscures the fact that [computers] are not necessarily serving democratic ends" (p. 484). Part of any democratization effort must consider the ways in which both process and product change in electronic writing environments as even more recent technological advancements foster a re-definition of textuality that

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includes visual and virtual media as well as dialogue among peers and between cultures. From a postmodern standpoint, such features constitute a version of intertextuality far removed from often traditional notions of textuality that posit the product to be a written, individual, or even printed effort. Although scholars (Selfe 1990; Lanham, 1993; Tuman, 1992) assert that computer-mediated communication has the potential to broaden notions of authorship, readership, interpretation, and hierarchy, very often our training to respond to student writing and our subsequent evaluations practices--with an emphasis on an individually produced hardcopy essay and its predominantly linear features--may actually limit the acquisition of multiple and hypertextual literacies required for our students' academic and professional success in the twenty-first century. For David Bleich (1988), the emphasis on individual assessment encourages competition over cooperation in that "the sharing or negotiation of knowledge among students must finally be subordinated to the student's performance as an individual" (p. 4).

Given our increasing reliance on computers in the writing process, it is important for students and teachers at all levels in the writing curriculum to discover the ways in which this newest form of literacy impacts the definition and evaluation of "texts" in both academic and non-academic contexts. In calling for a revision of the teacher education process, Jane Zeni (1994) stresses that "teachers should become researchers of their own classrooms," and should consider several questions: What does this technology help us do as readers and writers? Does technology enhance or limit the model of writing instruction in this setting? How does technology change the social relations in reading and writing communities? Such questions are also important because students' attitudes toward writing are so often influenced by the way in which writing is taught, i.e., if there is an predominant emphasis on correctness in mechanics or form or on privatized over socialized writing processes.

Early research connecting computers and writing assessment has focused

upon the ease with which computers facilitate the marking of error or the grading of large numbers of student text, but Brian Huot (1996) currently contends that little discussion exists on "using these technologies to create context-sensitive, pedagogically relevant assessments of student writing" and understanding "how students learn to acquire literate behaviors inside and outside the classroom" (p. 241). Yet as Andrea Herrmann (1991) has asserted, "computer-assisted writing changes the nature of the composition classroom, including the social context within which writing is taught and learned, the teacher's expectations, and the students' performances" (p. 151), factors calling for revised evaluation methods in computer-mediated environments, including the emphasis on the computer as "a medium of response" (Sirc, 1989). Such forums for response have included synchronous and asynchronous online conversation as well as electronic portfolios, the latter, as Huot notes, stressing what a student can accomplish with instruction, access, time, and context (p. 239), including, I would add, electronic writing contexts.

To address the ways in which such electronic contexts change our notions of what texts are, how they are created, and how they should be evaluated, I first overview how computer-mediated communication can broaden the definition of writing to include concepts of multimedia and multi-literacy, addressing the necessary integration of text and visuals and foregrounding the elements of electronic environments requiring revision of teacher and student response to students' texts. And through through the discussion of one specific electronic writing assignment, I argue for the need to work with student writers to develop revised evaluation practices and criteria that acknowledge collaborative writing, revising, and responding within an electronic medium as well as the ability to integrate visuals, texts, and sound, in order to address the shifting definitions of literacy fostered by electronic writing classrooms. Because many discussions of evaluation processes focus on first year writing classroom and because of the common emphasis on the "essay" within

such discussions, I instead focus on an upper-level course in professional communication, for within this context, the definition of text broadens for both students and teachers, shifting from traditional notions of the essay to address the integration of visual and textual rhetoric developed electronically but equally able to inform and persuade. Ultimately, I hope to show the way in which such assignment contexts and assessment practices can occur at various levels of the writing curriculum, further establishing the need for a broadened definition of writing as part of the teacher and student training process. While such a sample is from an upper-level course, it is also important for teachers and teacher-educators to acknowledge that the alternative forms of textuality and authorship possible within electronic environments can extend to all levels of the writing curriculum, including first-year composition and graduate-level courses in composition theory and pedagogy, the latter for the purposes of enhanced teacher training that I call for at the conclusion of this paper. Due to the changing contexts and changing features of electronic writing, from networks to desktop publishing, Gail Hawisher (1994) maintains that "how teachers explain these notions to students will reflect . . . their own understanding of . . . the way [such notions] fit into conceptual frameworks for literacy instruction" (45). Inevitably, such a process requires that teachers and administrators further foreground the changes within electronic writing contexts within our training programs within English studies.

Electronic Literacies

In *Word Perfect: Literacy in the Computer Age*, Myron Tuman (1992) asserts:

> It would be comforting for example, to be able to depend on the basic definition of literacy as the 'ability to read and write', but the meanings of reading and writing are themselves unstable. Even worse, their meaning[s] have shifted in the past, and may shift again in the future,

> precisely in response to technological change, so that questions concerning the impact of technology on literacy can quickly become circular: how do we study the impact of a new technology upon literacy, when our understanding of literacy is itself shaped by an existing technology, often in ways that are not fully conscious. (p. 2)

Regardless of this potential for computers to impact functional literacy in allowing students more facility in drafting and revising, and to impact critical literacy in allowing students to collaborate and dialogue to form new perspectives about issues they encounter in the classroom and the community, Tuman suggests that definitions of computer literacy are often too narrow, only involving the ability to type or the familiarity with basic word processing commands. While many computerized writing course prerequisites include the need for experienced typists, the emphasis on typing or word processing alone makes "computer-assisted" writing a mere adjunct to literacy, producing clean copy as a service to the reader (usually the teacher), rather than influencing the nature of textuality and authorship overall. Johndan Johnson-Eilola (1993) laments this process in which "the virtual, fluid computer text is only an intermediate step for many computer-based writers because the text often must be frozen into print: the computer is a sculptor's tool; the print text is the finished sculpture" (p. 381). But for Richard Lanham (1993), the increasing reliance on technology dictates that we not just look *through* texts for some universal meaning behind them but must also look *at* texts, to see how font, style, graphics, color, and layout are rhetorical and epistemological actions in which traditional concerns with purpose, style, and tone are both upheld or, as Lanham suggests, subverted. Despite such calls to recognize the epistemic, postmodern power of the "electronic word," Tuman's analysis unearths the common assumption that the most effective mode of self-expression continues to be the printed text, despite the fact that

"multi-media computing will soon make it possible to place in the hands of students tools for editing, combining, and linking hypertextually, not just pictures and words but video and music as well" (p. 112).

Given the traditional emphasis on print-based literacy, it is no surprise that the essay has dominated the English curriculum because of its status as a "miniature book," an attempt to produce a privileged form with English studies, and something both students and teachers have come to expect from the traditional English course. Because teachers are so accustomed to the essay format, it is natural for there to be some resistance to eliminate it from the curriculum, as the sustained reliance on this genre often maintains the power relationship between the teacher as expert, assigning expert essayists or canonized literary genres for student consumption, and the student as novice, feebly attempting to emulate a genre that has taken the professional writer years to master. In chronicling students' entry into academic life, Bleich (1988) notes that students "see the social process of intellectual life that really counts is the coping with academic authority" (p. 4), most commonly personified by the teacher standing behind the lectern or by the teacher marking errors on student texts. Due to these traditional expectations of the learning process in general, and the English classroom in particular, students entering electronic environments frequently feel a sense of anxiety, having been encouraged to accept a definition of literacy that has made writing the mysterious, private act of a few good experts.

Because of the sheer anomaly of such a privatized writing process, particularly for students entering professional discourse communities in which writing is constantly scrutinized and revised, Lanham believes that electronic literacy has the potential to foster a more public definition of the writing process, encouraging a dynamic process which redefines textuality as recursive and intertextual, process as opposed to product, and reader-based as opposed to writer-based. As a result, the

assessment process within electronic environments must account for the changes in process as well as in product, moving away from the individual, hierarchical assumptions that typify the product-based, print literacy grading paradigm.

Changing Technologies of Literacy in the Writing Classroom

To contextualize the changing nature of defining and grading texts in an electronic forum, the English program in which I most recently taught offered an upper-level professional writing course for majors in criminal justice, nursing, environmental science, and computer science, majors requiring this introduction to workplace communication formats and contexts. In an attempt to mirror workplace document standards as much as possible, the course was held in state of the art computer classrooms complete with 26 Power Macintosh 6100s, three scanners, two networked laser printers, and four networked dot matrix printers. In addition to word processing programs such as WordPerfect and Claris Works, and desktop publishing programs such as PageMaker and Adobe PhotoShop, the machines were networked to the World Wide Web, giving students access to such sites as the On-line Career Center, a major on-line forum for posting jobs and resumes.

As the nature of these classrooms suggest, the potential for both students and teachers to get a revised perspective of the changing standards for what a text is and how it should be evaluated is subject to the logistical and economic possibilities for or constraints against technological access. Such access is particularly vital in light of Mary Louise Gomez (1991) estimates that 30-40 percent of the student population will originate from a non-English language background by the end of the decade. Moreover, the access to literacy for many cultural minorities is inevitably an economic and political issue, given the decreased access of multicultural groups to education and the technologies of literacy, particularly computer literacy. As Lanham (1993) implies, the task of the traditional English class and its presumed audience of

white students prepared to accept the traditional rites of literary study must give way to the newer population of non-white students who often do not possess this traditional form of literacy and can benefit from a technological form of literacy in which students can find themselves on more equal ground in terms of knowledge. Because this population also includes returning male and female students, it is vital that such students be prepared for writing in electronic settings, settings to which access has been limited in prior work experience. The rationale for and success in securing electronic environments, therefore, is based on curricular goals that include the marketability of students through their knowledge of the most current technologies used to communicate in workplace settings, for although Gomez (1991) asserts that "We can only expect that the use of computers will contribute to students' . . . achievement, rather than their failure" (p. 331), it is clear that computer technology is reshaping the writing and communication process in all aspects of students' academic and professional lives. And because this process is more social than it is individual, it is also clear that the evaluation of such texts should account for the change from the privatized definition of the writer composing along at her desk without the need for feedback to a more public definition that acknowledges the writing process as a social and electronic network of peers and supervisors, all offering feedback that contributes to the writing and revising process, with the document going back and forth electronically between writer and readers and diffusing the traditional teacher-student hierarchy.

Very often, our students come to writing courses with traditional notions of what writing actually is, expecting that courses will focus more on grammar and correct format for report writing. Although these issues are within the scope of the curriculum, it is important to show students that everyday writing does not resemble the five-paragraph theme, but rather that successful communication is a combination of visual and written discourse, from the common memorandum with

headings and bulleted lists to the more sophisticated brochure or training manual. To increase awareness of this combination in students and in teachers new to computerized classrooms, I employ the following classroom exercise as an example of traditional versus non-traditional concepts of writing, a exercise requiring students to revise the following paragraph, originally part of a study by Reid and Wright (1973):

Exercise I. Space Travel Guide

> When time is limited, travel by Rocket, unless cost is also limited, in which case go by Space Ship. When only cost is limited an Astrobus should be used for journeys of less than ten orbs, and a Satellite for longer journeys. Cosmocars are recommended when there are no constraints on time or cost, unless the distance to be traveled exceeds ten orbs. For journeys longer than ten orbs, when time and cost are not important, journeys should be made by Super Star. (p. 161)

Upon reading these directions, even those students with a strong logistical sense have difficulty processing the options available to the potential space traveler, being unable to clearly distinguish between the variables of time, cost, and distance, as well as the mode of travel best suited for these constraints. The task for students becomes to use the existing technology available to them, in this case the graphic editors available on WordPerfect 3.5 for Macintosh, to revise the information to make it more readable and usable. Although it is important to provide students options for revising such information, it is also important to let students discover the visual and textual options for representing the numerous variables. As a teacher of electronic writing, I attempt to encourage a sense of inquiry into the ways the technology can help students solve a rhetorical problem, without letting the students feel as if they must know every aspect of the software package in order to complete the exercise.

This is also a benefit to the new teacher of writing in electronic environments, for frequently the instructor is positioned as not only an expert in writing but also an expert with the technology. Although one goal is to show students and teachers that they need not be experts to solve problems, another goal is to use the technology to communicate more effectively than the rhetorical constraints of the traditional essay text would allow.

In chronicling the features of electronic text, Stephen Bernhardt (1993) asserts that "writers . . . have many options at their disposal to make texts visually informative: white space, font sizes, line spacing, icons, non-alphabetic characters . . . margins, and the whole range of pictorial displays--graphs, charts, drawings" and concludes that "the use of computers for word processing has heightened our awareness of the graphic component of meaning" (p. 168). Indeed, in re-representing the space travel information, the students used various options more available through the technology, the use of headings, bullets, bolds, borders, italics, and so forth, all visual directives to help emphasize or clarify data by steering users "toward or through various information paths so that each reader is guided to the appropriate text for the task at hand" (p. 168). Among the revisions is one in which the student utilizes a table format, complete with color coding for emphasis. While in comparison to the paragraphed version of this exercise, any visual effort would be an improvement in representing the complex relationship among these variables, teachers and students who would review such documents could also consider the following assessment criteria relevant to purpose and format of this particular rhetorical task:

- Development of a rhetorical/social context for the document
- Recognition of multiple audience needs, e.g., stressing economy, luxury, speed
- Maintenance of an accurate relationship between the variables and

mode of travel

- Ease of accessing/evaluating the relationship between variables via the table format or other design structures
- Attractiveness of the document, i.e., a "style and tone" via color, font, etc.
- Placement of graphics to ensure visual and contextual integration within text and within the constraints of the page itself

Although teachers and students can apply such standard criteria to the document development process, it is equally necessary that students be allowed more voice in the revising and evaluation process via the more collaborative elements of the computer itself. Not unlike peer critiques of written essays in which students gather together with hardcopy drafts in hand, the common use of electronic class folders on networked servers also allows students to review peer documents and helps to create a forum in which the teachers' comments are one of a series of multiple-audience reviews. Other simple ways to encourage this type of peer review in the electronic writing classroom is to call up documents on the screen, and allow students to move from station to station, typing in comments at the bottom of the document, a practice the students used in the review session and I used in responding to final versions of the travel guide. In employing such "electronic studio reviews" with my own writing classes, I often utilize electronic mail discussion lists so that students may openly discuss their feedback with the class, establishing criteria, clarifying suggestions, and plotting out further revision plans before any final instructor feedback. This process also enables students to justify certain page design and style choices, such as the use of fonts, type size, columns, color, ultimately contributing to their grades by explaining the way in which such choices enhance the usability of the document. In this sense, the use of such electronic forums avoids what Bleich (1988) sees as the two-way direction of the traditional classroom, a site in which "students

suggestions, and plotting out further revision plans before any final instructor feedback. This process also enables students to justify certain page design and style choices, such as the use of fonts, type size, columns, color, ultimately contributing to their grades by explaining the way in which such choices enhance the usability of the document. In this sense, the use of such electronic forums avoids what Bleich (1988) sees as the two-way direction of the traditional classroom, a site in which "students hand work in and teachers hand things out" (p. 183).

As a preliminary exercise to get students thinking about the way they can utilize various software applications to solve a rhetorical problem, the space travel guide is worth 25 points, with points also being awarded for the extent to which students followed the revision plan they outlined for the class at the end of the studio review, a criterion which emphasizes process and not merely product. Within this 25-point scale, I also assign value to students' participation in the electronic studio reviews, noting, for example, if a student is absent, spends more time working on his or her own document as opposed to reviewing other students' documents, or fails to complete a revision plan. The revision plans are also vital to the document's development as they can better help students to understand the distinction between "knowing" the technology and "using" the technology, the former based in an authoritative, hierarchical structure and the latter based in a decentered, non-competitive process that inevitably contributes to the quality of the product itself in the overall concern for testing usability. This process helps to increase dialogue not only between the student and the teacher but also between the student and his or her peers who serve as audience and reviewers for the documents, and whose voices carry equal weight with the teacher as they produce, distribute and consume texts in an electronic context.

In comparison to other assignments within the course, the guide is worth fewer points in order to help students to apply graphic principles to more sophisticated

assignments, including a collaborative project in which students develop promotional documents for a community or university service. Such assignments help students and teachers recognize the way in which rhetorical context and purpose, as well as development, organization, and style, are as evident in electronically designed visuals as in pen and paper texts yet call for additional criteria and practices that represent the specific features of electronic texts that foster these same rhetorical concerns. Inevitably, an electronic revision of the space travel guide is a more usable document, aimed at readers in a ways that the original "essay-like" paragraph is not.

Conclusion: Implications for Teacher Training

Richard Lanham (1993) implies that perhaps those most resistant to what he has termed the "digital revolution" are members of English departments, who are often divided between what does and what does not constitute a text. But just as it is important to teach students the way in which rhetorical and literary texts are produced, distributed, and consumed, it is equally important for teachers of writing--as members of English departments--to acknowledge the production and consumption process of texts external to the genres of the academy, and to recognize that the essay is a printed form that admittedly for our students has little use outside the academy. Yet subverting the stronghold print literacy has in most English departments today does not necessitate the subversion of the standards of "good" writing. While in part I have attempted to show that similar rhetorical goals of purpose, audience, development of themes, and so forth, are all within the goals of electronic genres, the technologies of literacy that foster those goals have changed, increasing the need and opportunity for more empowering collaborative writing and assessment processes, particularly the inclusion of criteria that better represents the multimedia, multi-literate features of electronic texts. However, the problem still remains, as Tuman (1992) suggests, "that the unadorned text which has been practically the sole concern for language educators the last hundred years has also

been increasingly on the periphery of all other forms of communications" (p. 110).

Although students and their teachers need to learn to view non-linear, multimedia, hypertextual communications as "writing," the extent to which these attitudes can change will necessitate not only a redefinition of textuality but also a redefinition of teaching and assessment. As we become increasingly aware of this change, we must recognize that the teaching of writing must also be technological training, an awareness of varying reading and writing processes in a time when the images, sounds, and words of multimedia environments all impact meaning and interpretation, and where these modes of communication are not merely supplemental to traditional hardcopy models of textuality. Today's contemporary writers are involved in information shaping rather than information transfer and will be required to abandon more linear, individualized genres in favor of the multi-dimensional realms fostered by computer technology. And although our task as writing teachers is to train students to be literate enough not only to consume texts but also to produce them, it is vital that teachers themselves have access to the technology and to the theoretical and practical training required to use it. As Robert Royar (1994) concludes:

> Despite the advances in technology that can bring about a traditional teacher-based pedagogy to a learning-based pedagogy, most systems will simply ask untrained faculty to teach [computer-mediated writing] courses without any change in usual teaching practice. (p. 10)

Thus it is vital that teacher training in graduate and undergraduate programs in English and English Education acknowledge how more postmodern theories of textuality and authorship manifest themselves in our electronic classroom environments, for as James Sosnoski (1991) claims, the postmodern writing classroom is "likely to be an electronic classroom," the postmodern period itself being

"inaugurated by an electronic revolution" (p. 217).

As a result, teachers new to electronic environments should have the opportunity to be students in these settings, an important chance not only to understand the new technologies of literacy and the communication processes their own students will face in the classroom and the workplace but also to understand the initial sense of anxiety and potential confusion students may encounter in electronic settings, particularly students from backgrounds in which technology has not been as easily accessible. And just as teachers contemplate their own experiences and history with technology, they too can have students articulate their experiences in the form of a computer literacy biography, a non-graded, first-day writing assignment I have used to help students identify the external social and economic constraints upon their access to and comfort with technology, bringing these issues out in order to empower students within the computerized classroom rather than assume that the computers themselves are *de-facto* tools of empowerment. While employing literacy narratives can contribute to the broader goal of building a more dialogical curriculum (Soliday, 1994), the use of such exercises in the computerized writing and literature classroom can help students from various cultural backgrounds see that any lack of access or knowledge does not mean an innate lack of ability, an attitude that many students internalize, thus increasing their initial anxiety about writing and being evaluated in electronic environments.

Overall, the development of assignment contexts and response processes in the Space Travel Guide serve as alternative assessment tools designed to decrease both writing and computer anxiety by increasing student awareness of the changing aspects of textuality that will make them better prepared to write, collaborate, and respond in electronic environments. In developing revised writing and assessment practices within such environments, teachers must account for changing features of electronic writing processes, including a breakdown of the process/product dichotomy

toward the creation of what Johnson-Eilola (1993) terms "process-based products" (p. 385) and a cooperative relationship between computers and assessment, as others (Huot 1996; Takayoshi, 1996) have called for. As I have attempted to demonstrate, these changing writing and response practices will help to ensure a more dialogic interaction between students and teachers at all levels of the writing curriculum, with both groups working together to establish assessment practices that better represent the changing formats as well as "the increasingly social, collaborative, and interactive nature of writing with computer supported classrooms" (Herrmann, 1991, p. 155). With hope, such dialogue will further help to demystify the electronic writing process for both students and teachers. By recognizing the need for changing definitions of literacy in the electronic writing classroom, we not only increase the understanding and importance of writing in our students' scholarly and professional lives but also offer a new sense of confidence to those students who have traditionally had less success in meeting the more hierarchical writing and assessment standards of the print-literacy paradigm.

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